



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,032	04/21/2006	Isao Nishimura	21024/65527	4015

24728 7590 04/21/2011
MORRIS MANNING MARTIN LLP
3343 PEACHTREE ROAD, NE
1600 ATLANTA FINANCIAL CENTER
ATLANTA, GA 30326

EXAMINER

JOHNSON, CONNIE P

ART UNIT

PAPER NUMBER

1722

NOTIFICATION DATE

DELIVERY MODE

04/21/2011

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ipdocket@mmmlaw.com

ppz@mmmlaw.com

jlsmith@mmmlaw.com

Office Action Summary	Application No.	Applicant(s)
	10/541,032	NISHIMURA ET AL.
	Examiner	Art Unit
	CONNIE P. JOHNSON	1722

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3, 6-10, 12-14 and 21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 6-10, 12-14 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>12/8/09, 3/30/10</u> | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
5) <input type="checkbox"/> Notice of Informal Patent Application
6) <input type="checkbox"/> Other: _____ |
|--|--|

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

6. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/22/2010 has been entered.

Response to Amendment

1. The remarks and amendment filed 1/22/2010 have been entered and fully considered.
2. Claims 1, 3, 6-10, 12-14 and 21 are presented.
3. Claims 1 and 21 are amended.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 3, 6-10, 13 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al., JP 2002-155118A.

Harada teaches a photoresist composition comprising a copolymer and a photoacid generator. The copolymer comprises three recurring units comprising the

structure as in formula (1) in paragraph [0007]. The recurring units include: in formula (1) of paragraph [0007], R⁵ is formula (14) or (15), wherein R¹⁴ or R¹⁶ are alkyl groups with 1-6 carbons in paragraph [0020-0022], which meets the limitations of instant formula (3) in claim 1, wherein R³ is (Y-R⁶) and Y is a divalent alkylene with 1-3 carbons and R⁶ is hydrogen or Y is a single bond and R⁶ is a hydrogen atom. The second recurring unit is a lactone as in monomer 1 of paragraph [0074], which is representative of instant formula (6) of claim 1 wherein L is a single bond, R₄ is hydrogen and q=1. The third recurring unit is a recurring group with R⁶ as a 1,1,1,3,3,3-hexafluoromethylisopropyl group [0019], which meets the limitations of instant formula (4) in claim 1. Additionally, monomer 2 in paragraph [0087] is representative of instant formula (2) in claim 1, wherein the R¹ substituents are methyl groups, A is a single bond and B is an unsubstituted alkylene group. Harada also teaches formula (13), which is representative of instant formula (7) in claim 1. Although not exemplified, polymerizing two or more different monomer units, in the presence of a radical polymerization initiator is capable of forming a random copolymer. Harada also teaches a triphenylsulfonium salt compound as the photoacid generator in the composition and an organic base compound, such as N,N-dimethylaniline, which is capable of diffusing acid. The difference between the present application and the prior art is that Harada does not teach the ratio of weight average molecular weight to a number average molecular weight is 1.0 to 1.3. However, as shown above, the reference does teach 1.5 which is extremely close in range and the result would be expected to be the same, absent any evidence to the contrary.

"A prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. Titanium Metals Corp. of America v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985)" (MPEP 2144.05). Therefore, it would have been obvious to one of ordinary skill in the art that the polymer of Harada would be expected to have the same properties and perform in the same manner as the presently claimed polymer.

8. Claims 6, 8 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al., JP 2002-155118A. in view of Matyjaszewski et al., WO 96/30421.

Harada teaches a radiation-sensitive composition comprising an acid-decomposing resin, a photoacid generator and a radical polymerization initiator. Harada does not teach that the composition comprises a living radical polymerization initiator.

Additionally, Matyjaszewski teaches atom transfer radical polymerization (ATRP), which is a form of living polymerization, to form random polymers (page 33, lines 23-24 and page 36, lines 10-20). ATRP comprises polymerizing monomers in the presence of an initiator having a radically transferable atom or group, a transition metal compound and a ligand to form a copolymer (page 8, lines 19-26 and page 9, lines 1-11) (claim 6). Reverse ATRP is also conducted using a polymerization initiator, such as azobis(isobutyronitrile) (AIBN), which is a heat radical generator (page 30, lines 20-25) (claims 8 and 12). ATRP produces random copolymers with a polymer dispersity of 1.10 or less insuring greater uniformity in copolymer properties (page 42, lines 15-20).

Matyjaszewski also teaches that in conventional free radical polymerization, initiation is incomplete due to slow decomposition of the radical initiator, which yields

polymers with unpredictable weight, broader molecular weight distribution and uncontrolled structures (page 67, lines 1-9). Harada uses conventional radical polymerization to form the acid-decomposing polymer wherein the polydispersity ranges from 1.4 to 1.5 and would therefore benefit from a living radical polymerization initiator. Therefore, it would have been obvious to one of ordinary skill in the art to use a living radical polymerization initiator in the composition of Harada to form a polymer with a controlled structure and a narrow polymer dispersity value.

9. Claims 7, 12 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al., JP 2002-155118A in view of Matyjaszewski et al., WO 96/30421 and further in view of Le et al., WO 98/01478.

Harada teaches a radiation-sensitive composition comprising an acid-decomposing resin, a photoacid generator and a living radical polymerization initiator comprising a transition metal complex, an initiator with a radically transferable atom or group and a ligand to form a copolymer as relied upon above. Harada does not teach that the ligand comprises a structure as in formula (8) of claim 7.

Additionally, Le teaches a composition comprising polymerizable monomers, a living radical polymerization initiator and a transfer agent. The composition forms polymers with a low polydispersity of less than 1.1 (page 18, lines 10-11). The transfer agent comprises compounds, such as



wherein formulas (14) and (15) are representative of formula (8) of instant claim 7 when Y is a single bond, R' is an aryl group, R" is an alkyl with 1-15 carbons (page 25). Le teaches the transfer agents are used to form a polymer with a low dispersity. Therefore, it would have been obvious to use the transfer agents (14) or (15) of Le in the composition of Harada with reasonable expectation of forming a polymer with a dispersity index of less than 1.1.

10. Claims 14 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al., JP 2002-155118A. in view of Matyjaszewski et al., WO 96/30421 and further in view of Gennady et al., July 2001.

Harada teaches a radiation-sensitive composition comprising an acid-decomposing resin, a photoacid generator and a living radical polymerization initiator comprising a transition metal complex, an initiator with a radically transferable atom or group and a ligand to form a copolymer as relied upon above. Harada does not teach the composition has an alkoxyamide compound as in claim 14.

Additionally, Gennady teaches that living radical polymerizations mediated by nitroxides form polymers with low polydispersity values. The nitroxides include compounds with structures of TEMPO-Pest and TEMPO-EEest on page 3605. Although the TEMPO-Pest and TEMPO-EEest compounds have a C(CH₃)₃ group instead of a CH₃ group attached to the oxygen, the compounds would still function to initiate

polymerization the same as when the CH₃ group is the substituent. Therefore, it would have been obvious to one of ordinary skill in the art to use the TEMPO-Pest or TEMPO-EEst compound of Gennady in the composition of Harada to further improve the polymer dispersity.

Response to Arguments

Applicant's arguments filed 1/22/2010, with respect to the rejection(s) of claim(s) 1, 3, 6-10 and 13 under 103(a), claims 6, 8 and 21 under 103(a), claims 7, 12 and 21 under 103(a) and claims 14 and 21 under 103(a), all to Maeda, have been fully considered and are persuasive. Therefore, the rejections have been withdrawn. However, upon further consideration, new ground(s) of rejection is made herein.

In the new 103(a) rejections, Harada is used to show the copolymer as claimed. Additionally, Matyjaszewski teaches atom transfer radical polymerization (ATRP), which is a form of living polymerization, to form random polymers. Le teaches the ligand comprises a structure as in formula (8) of claim 7. Gennady teaches the composition has an alkoxyamide compound as in claim 14.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CONNIE P. JOHNSON whose telephone number is (571)272-7758. The examiner can normally be reached on 7:30am-4:00pm Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Connie P. Johnson/
Examiner, Art Unit 1722

/Amanda C. Walke/

Primary Examiner, Art Unit 1722